

Hubble’s new instruments will give expanded view of universe

(Continued from Page 1)
cabin. That analysis eventually showed the pointing assembly to be in excellent shape.

The final space walk followed two each by Lee and Smith and fellow Mission Specialists Greg Harbaugh and Joe Tanner. In all, the space walkers logged 33 hours and 11 minutes during the five space walks, about two hours shy of the time recorded during the five space walks for the first servicing mission. The two teams installed two new spectrometers and eight replacement instruments, as well as the insulation patches.

“We’ve completed all of the tasks we outlined prelaunch, more even than what we considered fully successful,” said NASA Mission and Payloads Development Director Ken Ledbetter. “We’re at maybe 120 percent of what we planned.”

With the servicing work complete, Commander Ken Bowersox and Pilot Scott Horowitz fired small maneuvering jets on

Discovery to finish boosting Hubble to an orbit about 9 miles higher than it had been when retrieved last week.

Smith and Lee began the service calls at 10:34 p.m. CST last Thursday, slightly later than had been planned. Ground controllers needed time to assess unexpected movement by one of Hubble’s solar arrays, which tilted apparently as a result of a gust of air from airlock depressurization.

Once outside, the first team of space workers replaced the Goddard High Resolution Spectrograph and the Faint Object Spectrograph. The telephone-booth sized instruments slid out of their compartments and were replaced by two brand new instruments, the Space Telescope Imaging Spectrograph and the Near Infrared Camera and Multi-Object Spectrometer. The STIS will take light gathered by the telescope and separate it into spectral components so that the composition, temperature, motion, and other chemical and

physical properties of astronomical objects can be measured. NICMOS will allow Hubble to take infrared observations of the universe, giving astronomers the capability to view cosmic objects not visible to human eyes. The first space walk lasted 6 hours, 42 minutes.

The second space walk began at 9:25 p.m. Friday and lasted 7 hours, 27 minutes. Harbaugh and Tanner replaced a degraded Fine Guidance Sensor and a failed Engineering and Science Tape Recorder with new units, and installed another new unit known as the Optical Control Electronics Enhancement Kit, which will further increase the capability of the new guidance sensor.

It was the second team of space workers that first noticed the cracking and wear on Hubble’s thermal insulation.

The third space walk began at 8:53 p.m. Saturday. It took Lee and Smith 7 hours, 11 minutes to remove and replace a Data Interface Unit that connects Hubble’s data man-

agement system and other subsystems; one of four Reaction Wheel Assembly units that use spin momentum to point the telescope toward a target and maintain it in a stable position; and an old reel-to-reel-style Engineering and Science Tape Recorder with a new digital Solid State Recorder that will allow simultaneous recording and playback of data.

Harbaugh and Tanner began the fourth space walk at 9:45 p.m. Sunday, and wrapped it up 6 hours, 34 minutes later. They replaced a Solar Array Drive Electronics package which is used to control the arrays’ position, then ventured to the top of the telescope to replace covers over Hubble’s magnetometers, which sense the telescope’s position in relation to the Earth. Harbaugh and Tanner also made the first thermal blanket repairs.

Discovery is scheduled to land at 12:48 a.m. today if weather at Kennedy Space Center allows.

EAA offers cruises to Alaska, islands

JSC employees will have the opportunity to cruise to Alaska this summer or the western Caribbean in November.

The Employee Activities Association is sponsoring a seven-day cruise to Alaska May 23-31 or June 20-28. The package includes round trip airfare from Houston to Seattle, overnight hotel in Seattle and motorcoach transfer to Vancouver.

Employees may select an inside cabin for \$1,294 per person or and outside cabin for \$1,477 for the May trip. For the June trip, inside cabins cost \$1,521 and outside cabins are \$1,705.

In November, the EAA will help launch the Norwegian Cruise Line from the Houston Ship Channel. This maiden voyage is set for Nov. 23-30 and will feature three ports of call including Cozumel, Calica and Roatan. Prices vary from \$977 to \$679 depending on cabin choice, plus a \$115.50 per person port charge and taxes.

For more information on either cruise call Dick McMinimy at x34037 or VIP Supertravel at 666-1800.

Linenger prepares for space walk

(Continued from Page 1)
The Optical Properties Monitor is the first instrument of its kind. “What makes it unique,” Davis explained, “is that it is capable of relaying information to Earth from orbit.” The experiment will take weekly measurements of the condition of the samples and transmit this information to scientists on Earth.

“With previous studies, measurements could only be obtained following the experiment’s flight,” Davis said. “With this investigation, measurements will be taken and relayed to scientists throughout the flight, providing more detailed information than gathered from any previous study of the effects of space on materials.”

During its scheduled nine months on Mir, the OPM will measure nearly 100 samples.

Goldin to address quality conference

(Continued from Page 1)
assurance at JSC and Sam Boyd, vice president of safety, reliability and quality assurance operations at Lockheed Martin. The keynote speaker is NASA Administrator Daniel Goldin followed by a presentation on “How Acquisition Reform is Changing the Industry,” by Leonard Kwiatkowski, vice president of the Space Systems Product Center at Lockheed Martin Aerospace.

JSC civil servants may attend the conference by submitting a JSC Form 75. Employees may contact Glen Van Zandt at x33069 for registration. Contractor personnel can call Larry Shaw at x32173.



AIRBORNE ASCANS—Astronaut candidates take a turn in the KC-35, that simulates weightlessness. Top: Top row from left are, Steve MacLean, Christer Fuglesang, John Herrington and Sandy Magnus. Bottom row from left are, Jim Kelly, Mike Fincke, Joan Higginbotham, Mark Kelly and Pat Forrester. Bottom: Top row from left are, Duane Carey, Frank Caldeiro, Yvonne Cagle, Dan Burbank, Steve Frick and Dave Brown. Bottom row from left are, Pedro Duque, Charlie Hobaugh, Charlie Camarda, Umberto Guidoni and Laurel Clark.



JSC offers college support to employees

JSC is currently offering three programs to employees interested in expanding their college education.

A new graduate program, the master of science in space studies, is now available to JSC employees through the University of North Dakota’s distance degree initiative. The program combines scientific, technical, medical, political and legal aspects of the exploration and development of space into a multidisciplinary curriculum. Students can focus in areas which include planetary science, global change, international space law and treaties, and space commercialization. Through the university’s unique distance degree initiative, students view videotapes of classroom instruction and then participate in regularly scheduled interactive sessions with the professor and other students via the Internet.

Admission requirements include a bachelor’s degree in engineering, science, business, social science, communication or information systems; minimum grade point average

of 2.75 overall or 3.00 for the junior and senior year and courses in statistics, calculus, or a programming language, sociology, psychology, or political science and any physical science.

To find more information on the program, check out the University of North Dakota’s web site at <http://www.space.edu/>

JSC again will sponsor the JSC Fellowship Program, which provides a select number of employees the opportunity to attend graduate school for one continuous year on a leave-with-pay basis. The center strongly supports such opportunities because they contribute to organizational goals through advanced academic training and enhance professional and personal growth. The criteria for this competitive program include: applicability of the chosen area of study and its effectiveness in contributing to the achievement of JSC’s mission and goals, a brief statement of academic purpose, academic record, written recommendation from the division chief, and

activity level in the employee’s office and the employee’s own workload.

Normally, applicants also must have at least three years of JSC service which may include co-op time. Applicants are responsible for their application and acceptance to graduate school and travel expenses. JSC will pay tuition and related fees. Regular service agreements requiring a period of three times the length of the training will apply to the program.

JSC also will sponsor the Project Increased Qualifications program, which provides undergraduate college opportunities to selected employees during duty hours. Both JSC and employees benefit through opportunities for employees to improve skills, become more productive in their present jobs and increase their qualifications for future jobs. The program helps employees do this by allowing them to: attend one to three college courses per semester, go to school during duty hours for up to eight hours per week, have tuition, required fees and

books paid for by JSC.

Mileage and other costs associated with travel to the college or university are the responsibility of the participant. Courses that do not relate to the employee’s current or reasonable future job or JSC’s mission will not be considered for the program.

Applicants must meet these qualifications to be considered for the program: be a permanent employee with at least one year of continuous civilian service; occupy a support staff or technician position in grades GS-1 through GS-11; and have completed a minimum of six semester hours of college level work, preferably within the last two years. Employees who already possess a bachelor’s degree are not eligible.

Applications for each of these programs are available in the Human Resources Development Branch in Bldg. 45 Rm. 146 and are due by March 28. For more information on any of these programs, call Kazuko Hall-Farley at x33075.

Bldg. 3 gets new look, Exchange Store coming soon

The Bldg. 3 cafeteria is getting a new look for spring and will house a new Exchange Store.

Renovation of the cafeteria began earlier this month and will include removal of the wall between the main dining and small dining area. Booth like-seating is currently being installed. Other improvements to the cafeteria include a raised dining/stage area, new carpet, window drapes, new wall coverings and energy efficient light fixtures.

An Exchange Store will be constructed in the northwest corner of the cafeteria. All work is being done after hours and on weekends to minimize interruption in food service.

Time to register for spring softball leagues

Registration is now under way at the Gilruth Center for the spring softball leagues that begin March 3.

Employees may choose from several types of leagues including competitive, recreational, mixed or men’s leagues. Cost is \$275 for competitive and \$200 for recreational leagues. All players are required to have an Employee Activities Association badge at a cost of \$10.

Employees may choose to play men’s B competitive on Tuesday and Thursday, mixed B competitive on Thursday, men’s C competitive on Tuesday and Wednesday, mixed C recreational Monday through Thursday or men’s D recreational on Monday.

For more information call x33345.

ISO review in work at JSC

(Continued from Page 1)
and procedures within various JSC organizations. Elements of the Engineering Directorate’s documentation were reviewed in November. In January and February all of the ISO elements were reviewed by the Safety, Reliability, and Quality Assurance and Center Operations Directorates. Other directorates are scheduled to be part of the internal document review soon. The reviews are conducted by civil servants from a broad range of JSC organizations and contractor personnel. All auditors have completed the required, rigorous ISO training classes.